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## Invited ViewPoint

Review and analysis of current responses to COVID-19 in Indonesia: Period of January to March 2020<sup>☆</sup>

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## ABSTRACT

The world is under pressure from the novel COVID-19 pandemic. Indonesia is the fourth most populous country in the world and predicted to be affected significantly over a longer time period. Our paper aims to provide detailed reporting and analyses of the present rapid responses to COVID-19, between January and March 2020, in Indonesia. We particularly highlight responses taken by the governments, non-government organisations and the community. We outline gaps and limitations in the responses, based on our rapid analysis of media contents, from government speeches and reports, social and mass media platforms. We present five recommendations toward more rapid, effective, and comprehensive responses.

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## 1. Introduction

The world is currently impacted by the novel coronavirus disease (COVID-19). The World Health Organisation (WHO) coordinates the global efforts to manage the impacts and it declared COVID-19 as a global

pandemic on March 11, 2020 [1]. The scale of the impacts is unprecedented, and studies have suggested that it might take more than a decade for the world to recover, societally and economically [2] and might significantly compromise the progress of Sustainable Development Agenda (SDGs) 2030. On March 27th, the G20 countries pledged \$5 trillion to defend the global economy against COVID-19 [3], while the United Nations (UN) launched the Global Humanitarian Response Plan for COVID-19 [2].

The pandemic started in the city of Wuhan, Hubei province, China and has brought many new challenges to public health in various countries. The world has experienced global public health crises in the last 20 years caused by novel virus infections, such as HIV, Influenza A virus subtype H1N1, Influenza A virus subtype H5N1, SARS-CoV1, MERS-CoV, and Ebola.

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However, the epidemiological novelty of COVID-19, which caused by a strain of coronavirus (the SARS-CoV2), revealed our lack of preparedness given its sudden and rapid spread that caught many governments around the world unprepared.

On March 26th, WHO issued six prioritised strategies, to be undertaken by governments to cope with the pandemic. The strategies were as follow: Expand, train and deploy health-care workers; Implement systems to find suspected cases; Ramp up production of tests and increase availability; Identify facilities that can be transformed into coronavirus health centres; Develop plans to quarantine cases; and Refocus government measures on suppressing the virus [1]. Lowering and delaying the epidemic peak is important. Uncontrolled measures will lead to the rapid increase in the number of cases, reach the peak earlier and require more capacity of healthcare systems to respond, while stringent control measures implemented early will help to lower the number of cases, delay reaching the peak and need considerably lower capacity of the healthcare systems [4].

Indonesia is the fourth most populous country in the world, and thus is predicted to suffer greatly and over a longer time period, when compared to other less-populous countries [5]. When the novel coronavirus SARS-CoV2 hit China most severely during the months of December 2019–February 2020, Indonesia reported no case of infection at all. Only on March 2, 2020, President Joko Widodo reported the first confirmed two cases of COVID-19 infection in Indonesia. As of April 2, the country has reached 1790 confirmed cases, 113 new cases, with 170 number of deaths, and 112 number of recoveries [6,7].

This paper is one of the first policy-response-focused academic publications aimed at providing a brief reporting, analysis and evaluation of current rapid responses to COVID-19 in Indonesia. To allow for rapid publication and dissemination of information, this paper does not intend to provide an exhaustive list of the responses, but it aims to capture current government-led responses in the middle of the crisis. This paper can be viewed as ‘real-time evaluation’ as it provides insights and lessons for all stakeholders to improve and adjust existing policy options mainly at national level from April 2020 till the end of the crisis. There are three objectives of this paper. *First*, to highlight key response strategies and actions in responding to COVID-19 emergencies in Indonesia. *Second*, to analyse the gaps and opportunities in these responses. *Third*, to put forward recommendations toward rapid, comprehensive and more systematic approaches in the short- and longer-term.

The methodology includes rapid analysis based on media content analysis including governments speeches and reports as well as observation of various social media platforms available from January to March 2020. We especially targeted online media contents from the website of [www.covid-19.go.id](https://www.covid-19.go.id), mass media as well as participant observations in social media platforms (e.g. Facebook postings from governments and relevant stakeholders). This paper is interdisciplinary in nature, with authors coming from various disciplines. This is a collaborative work following calls of co-authorships by the first author on March 26th, 2020. All authors are Indonesian scholars and experienced practitioners, with broad expertise on health/public health, basic biology, disaster governance, law, engineering, public policy, environmental science, culture and community advocacy, and risk communication. We aim to have a balanced analysis between those from natural and social scientists, focussing our analysis on the policy-relevant responses. Some authors are involved in response activities or providing government advice, both nationally and locally.

The structure of the paper is as follows. **Section 1** provides context, rationale and aim of the paper. It briefly presents COVID-19 impacts to date (as of 31 March 2020). We present our report on the key health strategies taken by the National government in **Section 2**. We further analyse the role of different organisations in **Section 3**. We review the roles of key ministries at the national level, responses at the provincial and local government level, along with roles of other major organisations and those at the community level (**Section 4**). This is complemented with our analysis of these responses, focussing on the gaps and limitations. Finally, in **Section 5**, we outline the recommendations for improving current responses, grouped into health-related and wider recommendations.

## 2. Key COVID-19 health-emergency impacts and early responses

This section reports on key responses in Indonesia. We first discuss the existing institutional framework on responding to health emergencies. We then focus on the early and rapid detection and diagnosis of infections.

### 2.1. Overview of key impacts and timeline

The initial zero case reported by Indonesia prior to the Global Pandemic declaration by the WHO, is questionable by many (e.g. [8]). During this period, despite reports of increasing numbers of infection from all countries surrounding Indonesia at that time, Indonesia did not issue any form of travel restrictions and specific quarantines of travellers coming in/coming back to Indonesia, even from severely hit countries such as China. On January 27, 2020, Indonesia issued a travel restriction from Hubei province, which was at that time, the epicentre of global COVID-19, while at the same time evacuated 238 Indonesians from Wuhan. After the initial and subsequent reports of infections, Indonesia started to realize the direness of the situation, and has since issued various policies and actions to tackle COVID-19, including appointing 100 domestic general hospitals as Referral Hospitals (Rumah Sakit Rujukan) on March 3, 2020. To cope with the ever-increasing number of COVID-19 patients, the number of Referral Hospitals was increased to 227 on March 18, 2020. However, despite such efforts, the number of victims keeps increasing rapidly. The Ministry of Health of Indonesia provides live data on COVID-19 impacts in Indonesia [6]. A coordinated information for covid-19 coordination is presented on this newly established website of <https://www.covid19.go.id/>. Fig. 1 shows the front page. To date, there are 20 dedicated websites by the provincial governments.

Data transparency in the early response has been criticised by several mainstream media. At least since 11 March 2020, the public had started to critically demand data transparency toward the government, which such plea emerged in digital news media [10,11] of which during the time there were already 27 cases reported. The lack of data transparency might have caused the underreporting of the actual number of cases, or, the dissemination of probably the actual number of cases detected, but not the number of actual infections, which could be undetected because of, for example, the lack of proper diagnoses. Such misinformation could severely impede the government's future responses. This indicated the possibility that such efforts were not enough.

### 2.2. Early and rapid detection and diagnosis of infections

Presently, RT-PCR (reverse transcription polymerase chain reaction) is the only acknowledged method to rapidly and accurately detect COVID-19 infection in humans [12,45]. First, the enzyme reverse transcriptase is used to change the RNA, which is the genetic material of SARS-CoV2, from nasopharyngeal swab samples, to DNA (the reverse transcription step). Next, using specific primers, a section of the synthesized DNA originated from the virus was amplified using the polymerase chain reaction (PCR) method. Only swab samples containing both human and virus RNA will show positive results.

Earlier mass media reports in Indonesia during the onset and peak of epidemics in Wuhan, China, suggested that there was zero infection in the country. This happened for a few months, even when various reports had shown that Indonesia's neighbouring countries had reported at least one infection. The lack of rapid scientific surveys deployed by the government to make swift decisions and actions has caused many pseudo-scientific “explanations” for the cause spreading in Indonesia, as seen in the mass and social media, ranging from racial superiority to religious and paranormal reasons (e.g. [13]). However, later reports strongly indicated that zero case was scientifically improbable, for example as suggested by Harvard University [8] and later severely criticised by the Indonesian Minister of Health [14]. Various international mass media and foreign bodies outside Indonesia even became very stringent and went as far as questioning the abilities of Indonesian scientists and medical practitioners, as well as the presence of enough



Fig. 1. Front page of INDONESIAN GOVERNMENT'S COVID-19 website.  
(Source: [9]).

technical facilities and skills to detect and diagnose the disease. Further investigations reported that many of the suspected COVID-19 persons were only diagnosed clinically and not tested using the PCR method, including Indonesians evacuated from Wuhan. This could be one of the reasons for the (most likely incorrect) report of zero infections, during the initial period of this global pandemic. At present, through extensive coordination among different institutions, Indonesia has started to do PCR analyses on suspected citizens. However, when compared to other countries such as Japan, Korea, and China, the number is not enough to reflect the most likely actual present condition of infection in Indonesia.

On March 19, 2020, President Joko Widodo announced that Indonesia will conduct massive testing by conducting rapid detection tests on the citizens [15]. This test will use recently developed testing kits, which are based on serology [16]. Results will be out in 10–30 min, which is much faster than the PCR test (about 1–8 h, depending on the method). Further news from the mass media suggested that the Indonesian government has ordered 500,000 testing kits from China. The mass media have reported the results of the first batch of tests conducted in Jakarta: 121 positive, and 10,338 negatives [16,17]. The problem is, although testing kits have been developed and even sold by various companies, none of the kits have passed clinical testing, without any clinical assessment on the actual specificity and sensitivity. Some reports have indicated that other coronaviruses, or even dengue, might give false positive results. Moreover, unlike the PCR test, which targeted the presence of actual genetic materials of SARS-CoV2 in samples, immunoreaction-based testing targets the presence of antibodies in the bodies of patients. The antibodies for SARS-CoV2 are known to be present from 5 to 14 days after symptoms appear, which means the antibody-antigen-based test cannot detect any infection prior to symptoms appearance, and thus might give false negative results. Meanwhile, the test might also detect antibodies presence on recovering or cured patients, and thus giving another false positive result. Indonesians shouldn't be used as guinea pigs, giving these pharmaceutical companies free nation-wide clinical trials. Therefore, such data must be handled very carefully, since a recent report by the *Business Insider* suggested that such rapid tests using serology-based RDT are only 30% accurate [16].

Indonesia needs to quickly and ambitiously collect information in order to obtain the big picture of present nation-wide COVID-19 distributions. This information will be important when deciding actual policies. Therefore, immunoreaction-based rapid detection kits (RDT) can actually be

useful if carefully used. For example, the test could be conducted as the first line of rapid public diagnoses, to select those who must take the more expensive and elaborate, but more accurate, PCR test. Only those tested positive by RDT must be required to do PCR test. Meanwhile, those tested negative, must take the test multiple times, up to at least three times, after an interval of 5 to 7 days, considering the incubation period of the virus. Also, because the result of this test will be very useful not only for global COVID-19 countermeasures, and for the private sectors producing the test kits, Indonesia must negotiate her position so that she will also benefit from using the RDT kits.

### 2.3. Issuance of Guidelines for Medical Rapid Response and Public Health Aspects of COVID-19

In late March 2020, the Indonesian Task Force for COVID-19 (*Gugus Tugas Percepatan Penanganan COVID-19*) issued the Guidelines for Medical Rapid Response and Public Health Aspects of COVID-19 in Indonesia. The guide targets the medical force and general public in terms of informing the means to mitigate the impacts and death rates. Information includes protocols for rapid tests using RDT, lab testing, patient handling, and outreach/communications means. The protocols for rapid testing and lab testing recognize three levels of risks: without symptoms (*asymptomatic*), person under surveillance (ODP/*Orang Dalam Pemantauan*), and patient under surveillance (PDP/*Pasien Dalam Pengawasan*). The test involves isolation of the suspected person, rapid testing, and ultimately, when required, PCR.

Indonesian Public Health Association (IAKMI) also regularly issued key recommendations for the Task Force that in general supported government measures and advocated for evidence-based policy. In one instance circular (20 March 2020) IAKMI encouraged the government to strengthen the role of the primary health care system and facilitate community-based responses of COVID-19 including education and surveillance. Recommendations were also made by Indonesia's Association of Specialist Doctors for Clinical Pathology and Medical Lab (PDS PatKLI). For instance, they issued cautions on possible caveats in interpreting the results of serology-based RDT tests for COVID-19 and suggested that negative results must be repeatedly tested by the same method over time, and positive results retested by PCR [16]. These emphasize that rapid tests should be viewed mainly to implement broader surveillance and epidemiological studies, in

order to understand the breadth of COVID-19 infection in Indonesia (PDS PatKLIm, circular 19 March 2020).

### 3. National governments' responses

This section presents key responses by different governmental organisations. We start with analysing regulatory and institutional frameworks for health emergency responses in Indonesia. We then discuss the formation of the Indonesian Special task force for COVID-19, a very important step in the response.

#### 3.1. Regulatory and institutional responses by national government

Most countries are caught unprepared to the speed and scale of impacts from the COVID-19. Several national regulations have been produced by the government at different levels from the president to ministerial levels during January–March 2020. Table 1 (ordered chronologically) summarises the rules and regulations produced to guide national and local response in Indonesia. The table shows that most of the regulations were issued after 13 March when the President established the Task Force. The head of National Disaster Management Agency (BNPB) was appointed as the commander. Prior to this Decree, national level response had been minimal as indicated by only two sectoral regulations were issued. First was the Health Ministry declaration of Novel 2019-nCov as a disease that outlines potential transform of COVID-19 into an outbreak and what can be done on 4 February 2019. Second, a national declaration of the specific emergency situation of COVID-19 by the head of BNPB on 28 February 2020.

One of the most important one is the President's Directives 4/2020 (*Instruksi Presiden Nomor 4/2020*) specifically instructing for refocusing of development activities, reallocation of government budget, and procurement of goods and services for rapid and accelerated response to COVID-19 (*Refocussing Kegiatan, Realokasi Anggaran, Serta Pengadaan Barang dan Jasa dalam rangka Percepatan Penanganan Corona Virus Disease 2019*) (see President Directive (Inpres) 4/2020 from Table 1).

**Table 1**

List of regulations created from February to March 2020.  
(Source: authors, compiled from different sources).

Date	Issuing agency	Title of regulation	Reference
4 February 2020	Ministry of Health	Declaration of Novel 2019-nCov as Disease that can cause plague and its response measures	Decision of MoH No: HK.01.07/MENKES/104/2020
28 February 2020	BNPB (National disaster management agency)	Declaration of Special Emergency Situation of COVID-19 Epidemic Disaster in Indonesia	Decision of Head of BNPB 9A/2020
13 March	President of Indonesia	Task Force for Rapid Response to COVID-19	Presidential Decree ( <i>Keppres</i> ) 9/2020
14 March 2020	Ministry of Finance	Distribution of Special Grant Allocation for Infrastructure in Health Sector and Grants for Health Operation for COVID-19 response	Decision of MoF 6/KM.7/2020
16 March 2020	Ministry of Health	Network of COVID-19 Laboratories	Decision of MoH HK. 01.07/MENKES/182/2020
16 March 2020	Ministry of Finance	Distribution and the use of Shared income grant, fiscal allocation, general allocation grant, special allocation grant and regional incentives for 2020 fiscal response to COVID-19	MoF Regulation No: 19/PMK.07/2020
19 March 2020	National Police (POLRI)	Prohibition of mass gathering or group activity both in public and local environments.	Kapolri Mandate No. MAK/2/III/2020
20 March 2020	President of Indonesia	Revision of Keppres on Task Force for Rapid Response to COVID-19	Presidential Decree ( <i>Keppres</i> ) 9/2020
20 March 2020	President of Indonesia	Refocussing of activities, fiscal allocation and procurement of goods and services for the acceleration of COVID-19 response.	President Instruction ( <i>Inpres</i> 4/2020)
21 March 2020	Ministry of Finance	Tax incentives for Compulsory Tax Holders affected by COVID-19	MoF Regulation No: 23/PMK.03/2020
23 March 2020	Ministry of Communication and Information	Acceleration of socialisation of COVID19 Prevention at Provincial and District/City levels.	Circulated letter SE 2/2020
24 March 2020	Village, Regional Disadvantage and Transmigration Minister	Village Response for COVID-19 and Cash for work in Villages	Circulated Letter SE 8/2020
31 March 2020	President of Indonesia	National Budgeting Policy and the Stability of Budgeting System for COVID-19 Pandemic Disaster and/or Managing Threats for National Economy and/or the Stability Budgeting System	Government Regulation in Lieu of Law No 1/2020
31 March 2020	President of Indonesia	Declaration of Community Health Emergency Situation for COVID-19	President Decree No 11/2020
31 March 2020	President of Indonesia	Big Scale Social Restriction for Accelerating COVID-19 Eradication	Government Regulation No 21/2020

The President Directive has major points of calling for rapid and active strategies related to budget reallocation, ensuring food security, strengthening health sector through basic health services and national insurance scheme (*BPJS*) for COVID-19 patients, changes teaching delivery and cancellation of national exam of schools, strengthening local governments and local economy, reduction of taxes for selected commodities, implementation of various economic and fiscal strategies for ensuring those affected receive certain compensations [9]. Some of these policy directions have been followed up at ministerial levels as can be seen in the rest of this section. Both central and local governments are working together with related stakeholders to execute the President's directives as mentioned above. It is however unclear whether we can say that the recommendations have been implemented since they have been only issued 2 weeks ago.

However, such Directive (Inpres 4/2020) was not strong enough to create national scale imperatives to rapidly end the spread of COVID19. Therefore, pressures have been made by many stakeholders. And finally, after long overdue, the President of Indonesia issued one decree and two fundamental regulations on the last day of March 2020 as this article goes to print. These regulations include: First, Regulation on National budgeting policy and the stability of budgeting system for Covid-19 pandemic disaster and/or Managing threats for national economy and/or the stabilisation of budgeting system; Second, A declaration of community health emergency situation for Covid-19; Third, Big scale social restriction for accelerating COVID-19 eradication (Table 1).

#### 3.2. Indonesian Task Force for COVID-19 Rapid Response

A coordinated response is extremely important. The first significant regulation is the formation of the Task Force for Rapid Response to COVID-19 (*Gugus Tugas Percepatan Penanganan COVID-19*) on 13 March 2020. This suggests that despite gaps in top leadership as it took more than 10 days after the first confirmed cases in early March 2020, the establishment of the Task Force provides better inter-agency coordination and response mechanisms. This task force is led by the head of BNPB, General Doni

Monardo. Mr. Achmad Yuriyanto is the task force spokesman, who is also both a medical doctor and the current Health Ministry's Disease Control and Prevention Director-General.

### 3.3. National Disaster Management Office (BNPB)

Managing an epidemic is not a natural mandate of BNPB. However, given the presidential preference and decision, the Head of BPBP has been tasked as the Chief of the Task Force (see Section 3.2). Overall, we are not able to provide an evaluation of BNPB given the lack of time for observation. However, it is worth noting that in addition to their key roles in the Task Force, the National Disaster Management Agency (BNPB) has been tasked to collaborate with Ministry of Health to disseminate the information of Covid-19 through different media platforms including SMS blasts; Established a rapid response team; Provide logistics, materials, and health facilities; Conduct surveillance for new potential cases of Covid-19; And Collaborate with the Indonesia National Armed Forces, Indonesia National Police, and Ministry of Health. BNPB is equipped with approximately 176 officials who will join the existing team of Pusat Pengendalian Operasi Penanganan Bencana/the Center for Disaster Management Operation.

### 3.4. Ministry of Health

Complacency has plagued the ministry from being proactive and able to lead the pandemic at national levels. Despite being heavily criticised for being reluctant by the informed public and academics from within and outside the country, the Ministry of Health has been one of the first ministerial level agencies to formally respond to COVID-19 since 4 February 2020.

Elsewhere in Indonesia, the health system capacity has been under capacity to cope with the pandemic at the moment. The legacy of the National Committee for Avian Influenza Control and Pandemic Influenza Preparedness [18] could not be seen in the present crisis. Such lack of preparedness can be seen throughout the six building blocks of the health system ranging from health service delivery, workforce, information system, access to essential medicines, health system financing and leadership and governance. Therefore, starting from 4 February, there was no clear indication of acceleration response to COVID-19 until first confirmed cases.

At the moment, despite criticisms for being not agile enough, the MoH has been playing critical roles as the national spokesperson of the COVID-19. Starting from February till 31 March 2020, at least 6777 tests had been conducted for covid-19 suspects out of which 1677 have been confirmed positive. Until the First half of March 2020, there were only 1100 tests carried out and 117 were confirmed positive. While starting from 16 March 2020, there are at least 5600 tests were done with 1560 were confirmed positive. Overall the testing has been very slow as the government has been quite passive in conducting diagnostic testing. Health infrastructure, especially health laboratories in Indonesia has been identified by one of the weakest problems in Indonesia health system [18]. The spread of COVID-19 has revealed these health infrastructure gaps. For example at present, the Indonesian MoH has designated only 48 laboratories across Indonesia to do COVID-19 diagnostics ([www.litbang.kemkes.go.id](http://www.litbang.kemkes.go.id)).

### 3.5. Ministry of Finance and Central Bank of Indonesia (Bank of Indonesia)

The Ministry of Finance, headed by former World Bank's managing director, Sri Mulyani Indrawati has made four major decisions namely tax-incentives policy, labour protection, rescheduling of loan repayment from small and medium enterprises (SMEs) and reallocation of fiscal policy at local government levels [19]. While new policies have been issued in the last week of March 2020, at this point of time, there is limited information on both the implementation of both financial and monetary responses from the Ministry of Finance. However, we provide some overview of the policies and their promises for future reference.

First, Decision to expand labour insurance (BPJS Tenaga Kerja) to cover COVID-19 related job losses. This policy is a form of protection for workers via 3-months cash transfers program where an affected worker is entitled to

Rp. 1 million per month. Second, there is provision for Minimum business protection measures - including a big push for the banking to relax payments from certain business groups that are too risky to be removed from supply chains [20–24]. The spread of the COVID-19 virus has the greatest impact on the financial and investment business sector including the most affected one such as Aviation, tourism, hotel, restaurant, shipping and transportation. Third, through the so-called counter-cycle policy, the government decided to relax fiscal policy, namely by widening the 2020 State Budget deficit to around 2.5% of GDP from originally planned at 1.76% of GDP. Widening the deficit means that there will be added spending.

The President of Indonesia recently highlighted the 'agenda to fight the two wars', namely the war against COVID-19 and the prevention of economic crisis. The Bank of Indonesia (BI) has a vital role to play in ensuring policy measures to anticipate the impact of the coronavirus on the financial market, and to mitigate macro-economic impacts. Key policies to stabilize the financial market due to the coronavirus has been introduced: BI will continue to monitor developments in financial markets and the economy, including the impact of the corona virus and continue to strengthen the policy mix and coordination with the Government and relevant authorities, to maintain economic stability, encourage economic growth momentum, and accelerate structural reforms [20–24].

### 3.6. Enforcement: military and police forces

As a democratic country, using the military and police forces is not a popular option. However, the Indonesian National Armed Forces (TNI; *Tentara Nasional Indonesia*) participation in the war against COVID-19 is necessary. We are not able to assess their effectiveness exhaustively and fairly here, but we can briefly highlight their involvements. For example, the use of military assets and personals is essential in this response where military aircrafts have been used to help with the logistical response at times where no civilian system can provide such support. TNI has been involved in the preparation of emergency hospitals in some locations from Wisma Atlet (Jakarta), Natuna, Pulau Sebaru, Pulau Galang Pangdam. Therefore, their roles in this non-traditional war have been essential. Interestingly, we also observed an emerging paradigm of non-traditional view of security forces, in social media and mainstream media during the last few weeks. In this view, frontline medical workers including doctors and nurses have been viewed as 'armies', combatting in the war against COVID-19. Since enforcement to ensure social distance and other mitigation measures are in place, we also observed that the role of the police has been critical in enforcing mitigation measures. The Head of the Police (Kapolri) issued a Mandate Letter (No. MAK/2/III/2020) on 19 March 2020 to prohibit mass gatherings or group activities both in public and private environments.

### 3.7. Ministry of village, development of disadvantaged regions, and transmigration

One of the most vulnerable groups are people in remote and disadvantaged regions in Indonesia where the health system and access to health service remains limited. The good news is that in the last five years, the central government has created a nation-wide incentive for village development through the Village Development Fund (ADD). At the moment, as instructed by the president and responded directly by the Ministry of Village, Regional Disadvantage and Transmigration, is to allow village governments (ca. 80,000) to shift existing funds for cash for work. Therefore, this is subject to future studies and investigations on how village governments can truly help COVID-19 affected communities by using the funding from ADD.

## 4. Broader societal responses

In this section, we review roles and responses, focussing on that of religious and socio-economic organisations, as well as communities. We

acknowledge that there are many other groups that have contributed to the responses such as those from international, non-government organisations, civil-society groups but not discussed in this paper.

#### 4.1. Religious culture and tradition: source of strength or vulnerability?

While religions provide comfort and sense of security throughout the history of human civilisation, their roles in pandemics can be both productive and counterproductive at the same time. As a religious country, Indonesia has experienced both good and inconvenient experiences in regard to religious views of COVID-19. Human fellowship characterised by routinised human contacts and gatherings around their house of prayers has been the key features of religious tradition from Abrahamic religions (Islam and Christian) as well as Hindu and Buddhism as well as countless of faith-based traditions in Indonesia. Their fellowship has been a source of dense social capitals that shape their worldview and source of inspiration and wisdom not only in today's pandemic but also in the past. COVID-19 brings new imperatives of social-cultural change by default. Therefore, when COVID-19 hit the world, the agenda for social distancing and isolation have been seen as an attack on the culture and tradition that lasted for some millennium.

Despite their unique adherents and to some degree counter-productive response in times of epidemic, religions should be seen as a solution and not a problem. We provide a brief overview of potential religions for countering COVID-19 pandemics. We have observed some (if not all) religious public gatherings in March 2020 amid COVID-19 that later led to the spread of COVID-19. From the perspective of disaster governance, where managing risk beyond government centric paradigm [25], religious organisations must be seen as governing power that can be equally powerful as governments given the capacity of their institutions, resources and members.

As the country with the highest number of Muslims in the world, the government of Indonesia cannot ignore the religious factors and roles in handling the spread of COVID-19 [26]. Three largest Islamic organisations such as MUI, Nahdlatul Ulama, and Muhammadiyah have developed their governing structure in a state-like structure, consisting of multi-level institutions from national to village levels.

Governments do not have all the resources to mass-campaign COVID-19 mitigation alone. In fact, the Government must rely on these organisations to use their resources (schools, health facilities, volunteers and clerics) and structures to conduct rapid promotion and education on COVID-19.

Indonesian Ulema Council (MUI) has real potential power to shape narratives that help Islamic communities in Indonesia to follow certain safety 'dakwah' (imperatives). In times of perils where 'social-distancing' has been promoted and sounded like an act against the traditions, MUI has been trying to introduce new imperatives aimed to mitigate COVID-19 from spreading. The MUI Fatwa Commission has issued Fatwa No. 14 of 2020. The fatwa explained the implementation of worship in the COVID-19 pandemic situation with the aim of safety and preventing the spread of the disease among Muslims [27]. MUI further forbids actions that cause panic or cause public harm, such as buying up and hoarding basic necessities including protection masks. The MUI fatwa also states that people who have been exposed to SARS-CoV2 must isolate themselves so that s/he won't infect others. Those who have been exposed to the virus can replace Friday Prayers with Zuhr prayer at their respective residences. For the management of corpses exposed to COVID-19, the MUI stipulates that bathing and caving must be in accordance with medical protocols and carried out by competent authorities with due regards to the provisions of the Shari'a. Meanwhile, burials need to follow the standard procedures [27]. Muhammadiyah formed COVID-19 Command Center and allocated hospitals [28]. Muhammadiyah has transformed itself to be one of the most agile promoters of health-based and hospital-based emergency response. MDMC has been instrumental in the disaster response system in Indonesia. Such institutions provide clinical services to COVID-19 patients in their hospitals.

The Indonesian Council of Churches (PGI) proactively called congregants not to come to churches on Sunday worships and did services through

the internet [20–24]. PGI also calls on all churches to form posts to deal with the corona virus outbreak. A case of the Synod Assembly Council of Western Indonesian Churches (GPIB) on 26 February 29, 2020, had four participants tested positive for coronavirus. PGI prepared volunteers to clean the house of worship by spraying it with disinfectant liquid [20–24].

Majelis Buddhayana Indonesia and the Indonesian Buddhist Tzu Chi Foundation have been instrumental in post-disaster response in Indonesia including COVID-19 response. The Foundation in collaboration with the Indonesian Chamber of Commerce (*Kadin*) have been able to fundraise US\$ 31.25 million (IDR 500 billion); They have distributed items such as insulation clothing, masks, goggles, gloves, as well as ventilators for the Ministry of Health along with several hospitals nationwide.

#### 4.2. Travel and tourism agencies

The drops in tourist arrivals during late February and March 2020 have made the tourism industry one of the first and hardest hit businesses sectors [29]. The Indonesian Hotel and Restaurant Association (*PHRI*) reported a loss of about US \$ 1.5 billion due to the corona virus outbreak since January 2020. The Indonesian Travel Agent Association (*Astindo*) reported that since February 2020, there was relatively no income for the travel agent industry. The loss experienced by the travel industry in the form of 80% of potential passenger cancellations is likely to continue to grow in the future. Nationwide, Indonesian business sectors including tourism have limited business continuity plans and management (BCPM).

Lack of business preparedness has long been an overdue issue but barely addressed by both the sector and the government. At the moment, there is no clarity on how to help this sector to survive and recovery after COVID-19 due to other competing priorities from the government. Tax incentives by the government could help but long-term recovery of the sector needs serious thinking.

#### 4.3. Digital and media thrives under COVID-19

Digital platforms such as *Gojek*, *Tokopedia*, *Bukalapak*, *Halodoc*, and *Ruangguru* have provided facilities and support in working from home, learning from home and praying or worshipping at home according to their respective fields of service [30]. *Gojek* and *Halodoc* have provided facilities for monitoring and checking health from home. While *Bukalapak*, *Tokopedia*, *Gojek* and *Grab* open opportunities to work from home, *Ruangguru* which facilitates the learning process from home.

Mainstream media has been at the front to correct the government's slow response since January till today [31]. Recently, On March 24, 2020, the first content was published with the hashtag *#AmanDiRumah*, as well as the launch of the hashtag *#MedialawanCovid19* [32]. This content is created in multiplatform which will be broadcast simultaneously on Tuesday morning on various television channels, radio, newspapers, cyber media and social media. With this awareness, it is expected that the rate of spread of the Corona virus can be inhibited. With this pattern, it is hoped that the available educational publication material can multiply and be utilized by all national and local media.

Initiatives to share information and educate the public against COVID-19 were carried out by journalists and the media industry. The objective of such a media movement is to spread a variety of educational content on a massive scale in an effort to combat the spread of the Corona virus in Indonesia. This initiative was attended by more than 50 national and regional media from various platforms, namely television, radio, print media, cyber media and social media in Indonesia [32]. This initiative arose spontaneously from the media and was independent, without affiliation and funded by any party. That way, journalistic work can still run as it should, by continuing to uphold the principle of independence. Through this networked work, it is hoped that various important messages in the fight against the spread of the Corona virus can be spread widely and reach all levels of society quickly.

#### 4.4. Community responses

The three most frequent changes in public behaviour are staying at home, washing hands more, and applied social distancing [33]. While some communities are more mindful of the risks than others, communities' responses should be seen as key to end this pandemic. They should be seen as a part of solutions and not the problem. In the earlier phase of the outbreak, it seemed obvious that the Government's scepticism and hesitance, or even denial of the potential pandemic occurring in Indonesia, had direct impacts and drifted communities away from favourable risk perceptions toward the pandemic. This is coupled by relatively low awareness and drills on pandemics, although a number of socializations had already been facilitated for example by the Ministry of Health in the past.

People's perception of COVID-19 risk might be low despite complex and rapid flow of information in the last since January 2020. It took time for the general public to process information on COVID-19 and take serious action to protect themselves. In the earlier phase of the pandemic, scientific or non-indigenous terminologies (e.g. Corona, Covid-19, the confusion of the differences between outbreak, epidemic and pandemic, etc) were used in introducing the risk, hence created distance on how such pandemic can affect one's life. Later on, simplified technical terms related to COVID-19 were introduced into local language as initiated by some academics and experts. English terminologies such as "social distancing" have been literally adopted by governments and the general public.

Slow progression of information and the disclosures of suspects or patients with positive diagnosis also created a lack of senses of emergency and perceived risk. This indicated how the government response had in fact contributed in shaping community's risk perception. The very low perceptions of risk, at least in the early phase also shaped unfavourable responses, which later on created immense problems for the government when deciding whether or not extreme measures should be taken to contain the virus spread. When school is closed nationwide, some families decide to go for mass family holiday and to go back to their hometown. In this sense, the context evolved in a vicious cyclical way that hinder appropriate responses both by the government and communities. Although later on, also due to extremely high exposure of the narratives in all types of media, the COVID-19, pandemic, and Corona, also terms such as *WFH* (work from home) as the relatively contemporary terminologies had slowly entered the public acceptance as the new norm. These are shown in the attitude of communities to follow the self-isolation or stay at home advice. The government is still adopting a position of holding off from nationwide lockdown.

Nevertheless, the self-isolation process is also a new norm, of which has almost never been a reflection of Indonesian general and sub-cultures, which is different from Japan for example. These are multiplied with numbers of informal workers, and types of professions that simply do not allow a person to work from home to earn their living. We have seen social media postings where some communities in Indonesia provided food for their infected neighbour in house isolation. Community self-screening for outsiders and health checks have also been conducted, for example, in some communities in Lombok Island as many migrant workers returned back from Malaysia and other countries. However, the limitation of technical knowledge and tools impedes the effectiveness of the initiatives.

Public misinformation and lack of communication among government levels triggered a misleading interpretation through instant social media tools e.g. WA, Facebook etc. (herbal medication can beat viruses quickly which brings to skyrocketing prices in particular commodities such as garlic, onions, ginger). Even more, some quick guidelines on how to make instant hand sanitizer and disinfectant are publicly spread in the community. Some activities to prevent the proliferation of viruses such as sunbathing have been implemented routinely by some communities and government entities.

#### 5. Recommendations for health and broader systems' resilience

Resilience is the key to enable rapid, successful, sustained coordinated approach and responses toward COVID-19 and future crises and emergencies (see e.g. [34]). It is about the resilience of nations, communities,

though not only physical and mental health, but also in its economy, physical and social infrastructure as well as those of nature and the environments.

##### 5.1. Strengthen health-responses as outlined by WHO, with initial consideration of long-term zoonotic risks and One Health approach

As the WHO [1] outlined, there are six priority strategies for countries to implement: Expand, train and deploy health-care workers; Implement systems to find suspected cases; Ramp up production of tests and increase availability; Identify facilities that can be transformed into coronavirus health centres; Develop plans to quarantine cases; and Refocus government on suppressing the virus. Specifically, for Indonesia, we underline these following recommendations:

1. Active tracing to close contacted patients and do massive rapid tests + socializing for staying at home and physical distancing as well for them. Identifying and mapping every single infected person with close contacts will be helpful for contact tracing and mass rapid test.
2. Coordinating, collaborating, and utilizing all of PCR laboratories (research institutes, universities, hospitals, clinics, local government) to support PCR-based diagnoses. More attention must also put on health infrastructure development including health laboratory development in all provinces.
3. Rapid detection tests (RDT) using kits based on antibody detections are known to be far less accurate than the PCR-based tests. Therefore, such tests must be conducted very thoughtfully, and the results must be handled with care. For example, multiple tests up to at least three times must be conducted for those tested negatives, while PCR tests must be done on those tested positive. However, because of the rapidity, obtained data can be used as a ballpark in order to get a broad view about the range and scope of COVID-19 spread. Preferably whenever possible, rapid PCR methods using the most current techniques (e.g. microfluidic RT-PCR), which is much faster (ca. 45 min until result) than the conventional methods (3–8 h), should be adopted, rather than the serology-based RDT.
4. Increase the number of referral hospitals adequately and equip such hospitals for treatment properly. This includes to properly set up treatment facilities (e.g. respirators, isolation chambers), diagnostics facilities (e.g. PCR machines, diagnostics kits), medicine and pharmaceuticals, management, medical doctors, specialists, nurses, health volunteers, and safety and protection equipment for frontline practitioners (e.g. safety goggles, protection masks, hazardous materials suits).
5. Incentive and disincentive. Incentive should be given to those who voluntarily report their symptoms to hotline/referral hospitals. Disincentive must be implemented to those who are still available out there without any relevant reason.
6. Mass spraying of disinfectant on the road, house, park, schools should be reconsidered since it may have little or no effect and may harm the inhalation of the people.
7. Develop proper health infrastructure including a proper government health laboratory system, which might include, not limited to, resources of private diagnostic labs, research institutes, and universities, in all provinces, to allow local COVID-19 testing without delays. We suggest that the MoH and DoHs at local levels should be more aggressive to expand the coverage of the whole six building blocks of the health system.
8. Furthermore, in the long term, COVID-19 reveals the need to mainstream the One-Health approach where animal and human health development should be integrated in order to achieve SDGs. Current approach that separates both health systems has proven not effective as revealed by COVID-19. The COVID-19 case has yet to be tied with Indonesia's elephant in the room, namely rampant wildlife trade at multiple scales. For example, domestic wildlife markets especially in Java (e.g. [35]) are ongoing, as are animals as source of drugs including traditional Chinese medicines business in Sumatra, and bushmeat consumption, including endangered bats in North Sulawesi. There are

delicate issues, because it is a matter of traditional food and part of the culture. Allowing all these to continue without reserve goes contrary to the safety principles against the wildlife to human infections (zoonoses) [36]. Systems need to be built to ensure safety (e.g. by testing for known pathogens) to prevent novel zoonotic pandemics [37].

### *5.2. Proactive, no-regret approach save life, strengthen disasters - humanitarian coordination and decision-making capacity for sub-national governments during crisis and emergency situation*

This pandemic proves a difficult time for rapid large-scale decision making for all governments worldwide. Presidential, nation-wide decisions are changing minute-by-minute. Leaders are faced with criticisms when deciding on whether to impose nation-wide lockdowns for example. This study shows that lockdowns have already saved thousands of lives [38]. Adaptive risk governance is about coping with complexity, uncertainty and ambiguity [39,46].

The country should strengthen its disasters-humanitarian coordination to manage the pandemic and broader emergencies, across and between levels, but also regionally within the ASEAN [40]. Indonesia has great experiences managing disasters with coordinated approach by the government, UN-OCHA in Indonesia or ASEAN through the AHA Center have been coordinated effectively [41,47]. Moreover, Indonesia still needs to be ready should an earthquake or floods occur including their potential occurrence amid COVID-19.

Djalante et al. [40] showed that focuses were mainly made at the national government response, with limited and varied focus on cross sectors and cross government levels. It is important to mandate local governments to urgently form their own special task force (*Gugus Tugas Percepatan Penanganan Covid-19 Tingkat Provinsi dan Kabupaten/Kota*) to accelerate responses and to achieve coordinated and coherent responses, involving key government offices and agencies, especially health, and communications and information. Sub-national governments also need to start proactive tracing and mass rapid tests for suspected persons. Some even decided to close entrance to their areas.

### *5.3. Strengthen the resilience of the economy*

Resilience is about the ability to absorb impacts, reorganise, learn, adapt, and transform [42]. It is about having the capacity to sustain development from expected and surprising change and diverse development pathways development [42]. Country and business leaders are moving urgently to protect their nations and organisations. Immediate action is critical, but we also need to embrace broader sustainability of all of society. On March 31, the UN launched a new plan to deal with the potential socio-economic impacts of the COVID-19 pandemic, calling on everyone to “act together to lessen the blow to people” [2]. Three global measures were outlined: (1) Global stimulus package to the amount of double-digit percentage points of the world's GDP, focussing on developing countries; (2) regional mobilisation to consider impacts, monetary coordination, fiscal and social measures, with involvement from private and financial sector;; (3) National solidarity needs to prioritize social cohesion and provide fiscal stimulus for the most vulnerable along with support to small- and medium-sized enterprises, decent work and education. This is extremely relevant for Indonesia. The economy needs to have the capacity to absorb the impact and focus on the most vulnerable people. Millions of jobs will be lost, with global assessment from the International Labour Organization (ILO), five to 25 million jobs will be eradicated, and the world will lose \$860 billion to \$3.4 trillion in labour income [43]. Health and unemployment insurance and social protection are necessary, to also support business (large, medium, small scales) to prevent job losses.

### *5.4. Utilise science-based multi-disciplinary decision making/ advisory, supported by big data/open science/citizen data, ensure transparency and strategic crisis and risk communication, and involve social influencers, especially to encourage general public to undertake self-isolation and health precautions*

We note that the COVID-19 task force has included scientists and recognised science-based, data-driven advisory and decision making. The role science advisory has been notable in helping the governments to respond. This important progress needs continuity. Multi-disciplinary advice by health/public health researchers and practitioners, social scientists, economists, legal experts, modellers will lead to better understanding of the contexts and potential impacts. Big data, artificial intelligence, open-science and citizen-data can accelerate current responses. Countries such as Singapore, South Korea, and China have attributed their aggressive monitoring through the use of these technologies.

Governments at different levels can prepare and manage their crisis and risk communication strategy by anticipating not only information overload in social media but create a system where both pro and anti-government hoaxes can be minimised. Transparency is key to managing pandemic as it provides a condition where infected persons can be quickly identified and treated accordingly in a timely fashion. Central and local government must develop an integrated strategy of crisis and risk communication strategy [44] that allow people to be informed to minimise any irrational behaviours such as ‘panic’ buying at local markets. It is also important to build the capacity of high-level officials at local level governments (provincial and districts) on decision making and crisis communication during crises situations. A good start has been made with provinces developing their own databases and websites sharing monitoring data for each the provincial jurisdiction.

It is commendable that social media has played a good part, e.g. advocating economic solidarity (increasing neighbourhood spending for informal workers). Interesting short videos raising awareness for self-isolation were made by members of the public, including by Najwa Shihab (renowned news anchor) and Nadiem Makarim (Minister of Education). More recently the awareness videos were made in local languages (Javanese, Sundanese and Sasaknese). However, many times also the social media has been invaded by dangerous hoaxes e.g. promoting chloroquine as a reliable drug to fight COVID-19, or alcohol-based hand sanitizer (and not soap) as the most effective prevention. The government has developed a hoax buster <http://www.covid10.go.id/hoaks>, albeit with limited amounts of information. Civil society such as Anti Hoax society group (*Masyarakat anti fitnah*) is also developing their own hoax buster such as <https://turnbackhoax.id/>.

### *5.5. Promote inclusive and community-based approach for community health resilience and preparedness*

Community-based responses may help to reduce pressure on local governments to provide relief responses. The government also needs to ensure an inclusive approach, considering vulnerable groups include people with disability. The UN Secretary-General launched the Global Humanitarian Response Plan, which explicitly includes persons with disabilities. In his remarks during the launch, the Secretary-General highlighted the situation of persons with disabilities in relation to the response, as well as planning for the future [2]. Organisation such as Arbeiter-Samariter-Bund (ASB) have long advocated for such an inclusive approach.

In conclusion, this paper has presented recent responses to COVID-19 in Indonesia. Most importantly, we outlined key health-related strategies and roles of different agencies in the responses. We complemented this with our analysis on the gaps and limitations in the current strategies. We put forward recommendations to improve the efficiency of the responses. We coupled them with wider considerations on how the current COVID-19 responses be used as a window of opportunities to strengthen the state of health, and place Indonesia in the path for healthy people and the planet.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. Riyanti Djalante is an Editor on Progress in Disaster Science. This manuscript was handled by a different Editor, with Riyanti Djalante blinded from the paper handling and peer-review process.

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